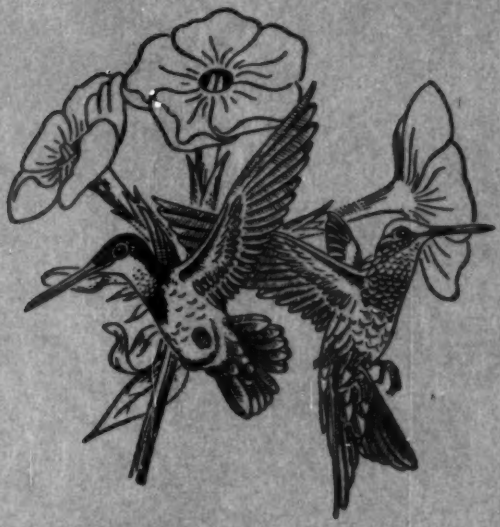
AVICULTURAL MAGAZINE



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VOL. 67 No. 5 PRICE 5/- SEPTEMBER-OCTOBER 1961

THE AVICULTURAL SOCIETY

Founded 1894

President: D. Seth-Smith, Esq.

Hon. Secretary and Treasurer: A. A. Prestwich, Galley's Wood, Limpsfield, Surrey.

Assistant Secretary: Miss Kay Bonner.

Membership Subscription is £1 per annum, due on 1st January each year, and payable in advance. Life Membership £15. Subscriptions, Change of Address, Names of Candidates for Membership, etc., should be sent to the Hon. Secretary.

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North Island Pied Tit

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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THE NEW ZEALAND PIED TIT

By ALAN R. LONGHURST (Freetown, Sierra Leone, West Africa)

The rather sombre beech and podocarp forests which still cover so large a part of New Zealand are enlivened by two species of the flycatcher genus *Petroica*. These small, alert birds of the ground or shrub layer in heavy forest, have a superficial resemblance to the European robin (*Erithacus*) in shape and movement, but are quite clearly more closely allied to the Muscicapidae. Birds of this and related genera are rather widely spread in the Australasian region and have become specialists in island-hopping, so that a considerable number of isolated island races of several species may be recognized. In New Zealand, the birds may be divided into " tits " (sub-genus *Petroica*) and " robins " (sub-genus *Miro*) ; the latter bear a very close resemblance indeed to the European Robin but lack its red breast, while the tits are smaller and generally more strikingly marked.

In the North Island, the Pied Tit (*P. macrocephala toitoi*)—which is illustrated on a branch of southern beech—is a common bird of the shrub layer in the native and some exotic forests, while the Robin, which feeds more at ground level, has almost disappeared before the invasion of cats, rats, and stoats and is now only to be found in a few mainland areas and in the island sanctuaries. The writer has a very vivid memory of a pair of Robins feeding, literally around his feet, in the dense coastal forest on the slopes of Kapiti Island. Pied Tits, which are as tame and fearless of man as most New Zealand passerines, may be watched at almost as close quarters in any block of mainland forest. Insect eaters, they are constantly on the move—generally in pairs—now dropping to the ground for an insect, now perching on the side of the trunk of a great podocarp, and may be attracted, even closer to the watcher than they normally approach, by a squeaking noise from the lips or from cork and bottle. It is said that they are at once attracted to the sound of an axe in the forest.

The South Island form (*P. m. macrocephala*) generally known as the

Yellow-breasted Tit differs only in the colour of its breast and in unimportant size differences ; it remains common in most forest areas. On several of the groups of islands off New Zealand geographical races may be recognized which show—as Dr. Fleming has recently demonstrated—some most interesting variations. In the Chatham Island race there is a tendency for the female, drab in the mainland race, to develop the male pattern in its plumage, and this tendency is carried to its conclusion in the Auckland Island race, from far to the south of New Zealand, in which male and female are superficially similar. On the Snares a completely melanistic race occurs.

It seems probable, apparently, that this series of subspecies is very closely related to—and may even be conspecific with—the Australian Scarlet Robin (*P. multicolor*) in which the nominate race has a rich scarlet breast, but is otherwise similar to the New Zealand species, and which itself includes a number of island races which extend from Norfolk Island to the Solomon Islands.

As with most New Zealand passerines, there has been very little detailed study of the behaviour and ecology of these birds, though much very fine work has been done on various sea birds in the country. Perhaps some day an explanation will be given of a very curious habit of the male of the pair of Robins watched at arms length on Kapiti. It was feeding on the ground, among a litter of dry leaves which were hunted quite systematically and below which insects appeared to be detected, probably by sounds. At frequent and regular intervals the bird would perch on a dry twig, or the main rib of a large dead leaf, and putting its weight on one leg would vibrate the other foot so that its outline was blurred and a hissing, rustling noise was produced—but so soft that only the nearness of the bird made it audible. Was the noise deliberate or accidental, and is this a normal feature of Robin feeding activities ? Could such a sound induce insects to move and give away their positions and, if so, does the habit occur in any other birds ?

* * *

THE BREEDING OF THE BRITISH STONECHAT

(*Saxicola torquata hibernans*)

By the Rev. J. R. Lowe (Coln St. Aldwyns, Glos., England)

During the autumn of 1960 a hand-reared pair of young Stonechats were received and wintered indoors with no heat throughout the winter. They were very tame and took mealworms, etc., from my fingers. At the end of February the birds were put out into a planted aviary 36 ft. × 36 ft. × 6 ft. 6 in., with a double-compartment, old pigeon loft as an indoor shelter.

On 25th March the cock Stonechat was noticed in display and occasionally chasing the hen. The display was interesting, as in so many courtship displays, the bird altered his whole contour and changed from a rather chubby little bird to one that was long and thin, the head thrown up, the tail flicking, all the white areas, such as white collar and white wing-coverts appeared continuous, and white rump much in evidence. This was accompanied by a curious slow butterfly flight from one part of aviary to the other and a good deal of loud clicking from the cock. The hen appeared rather indifferent to this activity. At this time the cock produced a more attractive little warbling song. On 26th March the hen had a dead leaf in her beak, though I couldn't believe she was really building ; between 26th March and 2nd April we had discovered the nesting site, about 2 ft. 6 in. up in a tightly clipped *Lonicera nitida* bush close to the aviary wire. A tremendous foundation of leaves and sticks and dried stalks and dead grass was first laid and the cup of the nest began to be fashioned and lined on 6th April. Lining continued on 7th April, a few feathers were used but moss and dead grass formed most of the lining. The hen did all the building ; once or twice the cock picked something up and while the hen was on the nest took it to her and for a minute or two both were inside the bush, but the cock was inside only for that brief time. On 8th, 9th, and 10th April both visited the nest, cock sometimes calling hen to visit the nest, which was complete and not added to as far as one could observe after 7th April, so that the nest was completed in 13 days. On the evening of the 10th the hen looked a bit thick and on the morning of 11th April there was one egg. Both birds were still ridiculously tame and still took mealworms from anyone who cared to offer them and the hen, all through her building activities, never turned a feather, no matter how close people were to the nest. Five eggs were laid. The birds were not seen to pair.

On the evening of 28th April the cock met me in the shelter compartment with a newly hatched Stonechat in his beak ! He flew down at my feet and laid the baby on the floor. It kicked slightly and I picked it up, warmed it in my mouth, and transferred it to the nest: the

mother grumbled slightly, but received it without leaving the nest and shuffled it and her eggs like an old hen; I fled from the aviary, wondering if I ought to remove the cock. On 29th April a quick look at the nest when the hen was off revealed two tiny open mouths and two eggs. I felt a little better, but wondered about the fifth egg. Was the chick I rescued the first victim, or the second? Had the cock poured two babies out with the bath water, or only one? Was this nest cleaning gone sadly awry? Was a baby mistaken for an egg shell? He never made the mistake again.

30th April. There was one chick and two eggs. The nestling appeared healthy and down looked dry, and growth was considerable even in twenty-four hours. The chick continued to grow rapidly. I was rather worried about food as ants' eggs were scarce and insect life in the aviary not abundant, despite a fairly liberal heap of manure in one corner. The weather was rather dry. Maggots were not used in feeding and the main diet of baby was cut-up mealworms; soft-bill food and hard-boiled egg was always available. On the eighth day I put a closed ring on the baby.

On 10th May the hen met me carrying building material! My heart sank; the nest was empty and was being redecorated. Under the bush was the baby, dead but an hour or two, and the two infertile eggs. I could have wept. On 15th May there were three new eggs in the old nest, and two more appeared. All the eggs were very round, a pale greenish-blue, with faint reddish spots at one end.

On 30th May a chick hatched and did well, other four eggs infertile. Ringed on the eighth day, it was turned out of the nest on the ninth day. My cup was full! A friend had sent a big box of wood-ant eggs, accompanied by a considerable number of highly indignant wood ants, and the second Stonechat baby had done even better than the first. Was it the ringing that had caused this hideous infanticide? Was it possible that in the first case the hen had come into breeding condition too quickly a second time, because with only one chick to feed she hadn't enough to do? The cock did most of the feeding after the first few days and nearly all the nest cleaning. There must be a big difference in looking after one nestling instead of five and often six?

On 16th June I discovered that the hen Stonechat had decided to have a third go. She had chosen an old coco-nut husk, about 5 feet from the ground, and had laid as far as I could see three or four eggs. Not very much of a nest, just a little lining of dry bents. Five eggs were laid; and I decided no more beastly closed rings. Anyhow I could not have got at the babies to ring them.

To cut this third story short, on 14th and 15th July three young Stonechats left the nest and have continued to do brilliantly to date, 14th August. They were reared for the first week largely on wood-ant eggs, which they shared with a family of young Goldfinches that were

hatched about the same time in the same aviary, and with mealworms *ad lib.*

The old pair of Stonechats are now in a heavy moult. The babies (a cock and two hens) are in a separate aviary, looking very sleek and reasonably tame. They have been persuaded to take maggots and large quantities of earwigs, caught in pots near the dahlias. So ends this saga, and we wonder how often Stonechats have been bred in captivity before.

The latest acquisition is a pair of Goldcrests, hand-reared. The most charming birds I have ever had. Embarrassingly friendly and prefer one's company to one's absence, which could make one conceited. They have now got their crests and are, I think, a pair. The cock has been actually going through a form of display and singing as I have been writing ; I begin to wonder if he does not get too rough at times and I may have to put a partition in their cage. But they are the most delightful of all the British softbills that I have ever had. It seems amazing that at so early an age the cock should be in display with gold crest erect and tail fanned out and wings dropped. We hope to persuade them to go to nest next spring.

Cockatiels and Dwarf Ruddy Ground Doves have been reasonably prolific this season.

* * *

EXPERIENCES WITH LIBERTY BUDGERIGARS

By E. L. Taylor (Guildford, Surrey, England)

To provide the pleasure of watching birds in flight is a branch of aviculture that makes its own appeal, falconry doubtless affording the finest spectacle. I can well understand the obsession of Frederik II of Hohenstaufen who, in the thirteenth century built palaces for his falcons and, whilst making history for Europe, wrote (by his own hand) a long and interesting account of this sport of kings.* In our age of spreading populations, more numerous and mobile than ever before, it is too difficult to secure the hawks and to find the necessary space ; on which account we must be content with fowl of humbler kind. For my own part it is high-flying tippler Pigeons and liberty Budgerigars—and I do not apologize for the implied comparison with Goshawks and Peregrines.

Although I know the subject to be taboo in the Avicultural Magazine I should like to make one brief reference (for the purpose of illustration only) to those high-flying tipplers that I find so interesting ; birds completely under my control, that can be released at will and watched, by the naked eye or through binoculars, as they mount higher

* *The Art of Falconry, being the De Arte Venandi Cum Avibus of Frederik II of Hohenstaufen.* Translated and edited by Casey A. Wood and F. Marjorie Fyfe. Stanford University Press. Reprinted 1955.

and higher, until sometimes they enter clouds, or are out of sight in the blue sky. To know those birds as individuals, that only an hour ago were held in one's hand, who's young are in the nest, with their feathers just beginning to burst from the quill ; to watch their enjoyment in the air is to enjoy flying oneself. One cannot be quite so intimate with Budgerigars, but one can have these lively birds under some control at least, and produce in one's own garden a most excellent display of avian aerobatics.

I am not versed in the history of the art of keeping birds at liberty : I suppose the Duke of Bedford to have been the first to work out a *system* of managing Budgerigars in this way, although I should be interested to know how much of it was original, and how much had already been practised with other kinds of cage birds, perhaps for hundreds of years. Of course I studied his method with care. It is well explained in his excellent little book, which, however describes rather grandiose accommodation, and savours here and there of a past age.*

The starting point of my experience was the acceptance of five Budgerigars as a gift from the village decorator. There were three green and two blue, of a very ordinary kind and to these I added seven others, two " yellow-winged greens ", two " white-winged blues ", two " cobalts " and a " white ". They were all of the cheapest procurable, and I made no attempt to secure so-called " homing Budgerigars ", considering it unlikely that such a character could, as yet, have become fixed in any strain.

Indoor accommodation was quickly constructed in part of a large shed, and during that winter I erected the flight outside. It was of very modest proportions compared with the one recommended in the guide book, 7 feet high, 7 feet wide and 13 feet long. I also constructed a number of nest-boxes, in readiness for the proposed increase of stock during the next two seasons, as it was my intention to build up towards one hundred birds before release in 1958.

1957

The first season was a failure, owing to my lack of understanding of the psitticine mentality. It was not that my architectural potentialities were at fault, rather than that my dwellings were too desirable. Some of the designs made a tremendous appeal, but in so doing aroused the envious nature of the Budgerigar hens. I was amazed to find the savagery that lay deep down in the character of those little birds. It was made clear to me that if a Budgerigar really wants something that belongs to another, and murder is the most direct way of getting it, then murder it is. Eggs were thrown out, young birds similarly disposed of, and even adult hens done to death in their own bed chambers.

* " Homing Budgerigars " by The Duke of Bedford. Published by *Cage Birds*.

The persistance of the aggressors was both painful and wonderful to behold. There was no cessation until an entrance had been forced and the awful work had been completed.

1958

In preparation for this second year, therefore, I erected a " slum ", a long hollow tube, square in cross section and partitioned into twenty dwellings, separated from one another by thin asbestos walls ; with identical front entrances and identical back doors—also of asbestos. The door latches were identical and the floors were standard floors ; the only way to differentiate between one and another was by the numbers that were painted in plain standard figures on the front and on the back. I destroyed the distinguished architecture—the houses of character—and calm returned to the commune. Of course infanticide,

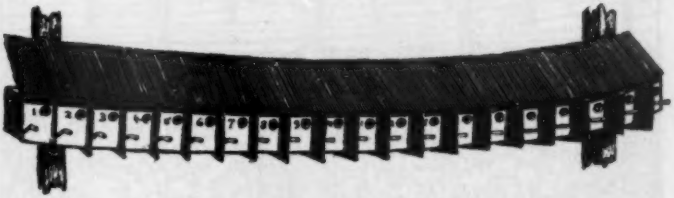

FIG. 1.—Row houses for budgerigars.

and ovo-infanticide continued to a certain extent, some of the hens still being activated by envy of another's family—envy seems to be the besetting sin of the Budgerigar—but it was not now the expected end of eggs and young, and before the summer was over there had been a three-fold increase.

Although the numbers were still not quite what I thought they ought to be before venturing to let the birds fly out, I decided to start in the following season, whether Budgerigars seemed to be sufficiently numerous or not. During that winter I constructed the ladder exit and the lobster-pot entrance hole, as described by the Duke of Bedford.

1959

At last, on a fine and calm Saturday morning in April, I opened the door at the top of the ladder that led to the open air of a large garden, with many trees, and rural surroundings, where there is no confusion of similarity of human dwellings and of gardens. There were now between thirty and forty Budgerigars in all, and I watched several of the more venturesome climb up the ladder and fly away in obvious glee. Perhaps a dozen went out at this time and flew swiftly around in a magnificent aerobatic display. Their skill on the wing was even better than I had supposed it to be, and their delight in the newly-found freedom was a pleasure to behold—but they did not return.

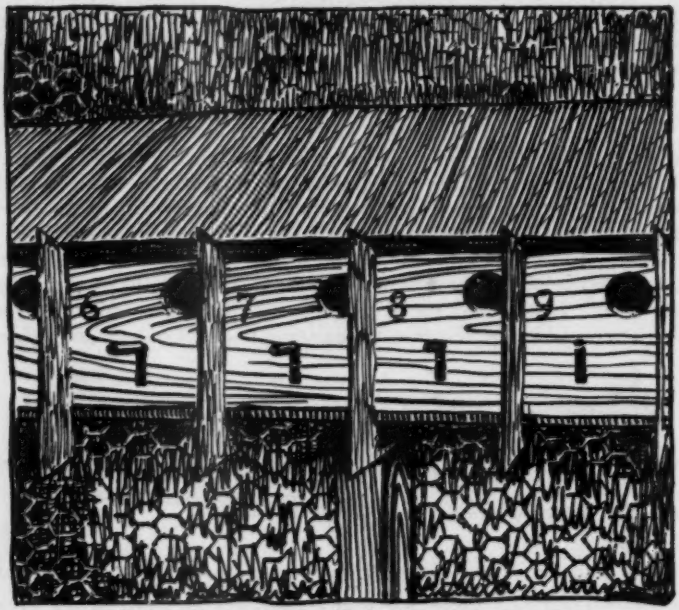

FIG. 2.—Front entrance of Budgerigar row houses.

Now and again I saw one fly across the garden, often high in the air, but without appearing to recognize the place where it belonged. One or two did eventually find the way into the flight, but it seemed only by chance that they happened to be near their home, where they saw the other Budgerigars, and ultimately found the way in.

This first trial of the Duke of Bedford's method seemed, therefore, almost a complete failure, and I was very disappointed. Clearly something else must be done, or I should lose the lot. As it was, I had lost 80 per cent, or 90 per cent of those that I had allowed to go out, and a halt was called while new methods were considered.

For this purpose it seemed wise to invoke the scientific approach and start from first principles. I perceived that the problem that faced me was an educational one, of perception, recollection and facilitation. The senses through which the appeal had to be made were those of hearing and of sight. Although in no way melodious these birds are at least vocal—so I reflected—they might even be considered vociferous. I concluded that they must have a language, of a sort, not for the communication of information, but a mere *talk* for the maintenance of contact, and continued assurance of good fellowship—as of washerwomen at work, or of school girls on a picnic. How could I use this

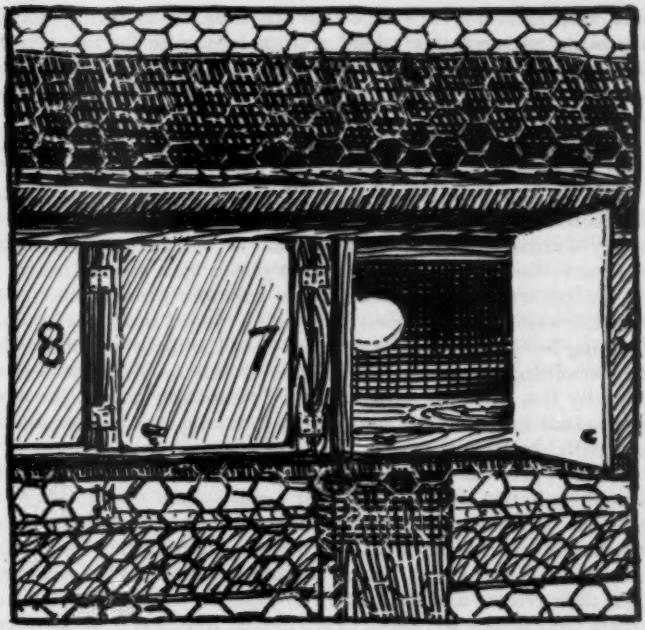

FIG. 3.—Back doors of Budgerigar row houses, accessible from outside the flight.

to bring birds home? Had the technologists produced any recent developments that might help? These were the lines along which my thoughts ran, and it so happened that my boy Jan had recently bought a tape-recorder, why not, (I thought), make use of this modern equipment to amplify the normal chatter? Better still, why not make the birds say something appropriate, record that, and then reproduce it very loudly?

Acting on this idea I bought a reel of tape, borrowed Jan's recorder and proceeded in the following way to elicit the calls that seemed best suited to the purpose of bringing lost Budgerigars back to their home.

It is a most commendable arrangement in the Budgerigar community that the hens shall stay indoors to sit on eggs and tend the very young, and free the cocks to carry on with little flirtations, to enjoy the open air and at night to repair to a comfortable shelter, a sort of club, away from the hens, where, after a little more talk they can go to sleep, looking forward to the beginning of another pleasant day. Nothing was easier, therefore, than for me to go down there after dark and to close the little door between the shelter and the flight, where the hens were, in the nest-boxes, with eggs and young. I found that if this were

done, and the two groups were kept apart, on the following morning, they made an increasingly loud and anxious noise for two, three or four hours. Translated into human tongue it would represent the continuous shouting of the following words and phrases :—" Where are you ? "—" Come here "—" I want you "—" Come quickly "—" Please come now ". And later on in the morning :—" Help ! "—" I'm starving "—" Wherever are you ? "—" We're all starving "—" Come at once "—" Help ! Help ! ". This kind of calling went on with increasing emphasis, and, one may suppose, with mounting tonal quality of anxiety such as human ears may be unable to detect, but that might nevertheless be recorded and amplified by a tape recorder.

A temporary family separation was therefore brought about, and when the wailing had reached a very high pitch I made a 35-minutes recording before opening the door between the flight and the shelter, and permitting the reunion so long over due. The recording was vetted by Jan, who had pronounced it " reasonably good " (he would never admit to perfection) and on the following day I made another essay with liberty Budgerigars.

As at the previous trial, perhaps a dozen soon found the ladder and without hesitation made use of their wings for the exploration of the unknown. It was quite clear, from the elevation at which some of them flew, that it was no mere matter of hopping from bush to bush ; they really meant to go places. On this account I soon began to worry again about their return, and went down to close the outlet door. As I did so there were Budgerigars to be heard in near trees and in distant trees ; I saw them streaking through the garden, or flying higher than the tallest of the trees, but they seemed to have no idea of coming to inspect the home with which they were so familiar, on the inside.

The recorder was standing in readiness in the open window of the shed, so I started its loud reproduction of the agonized calls of isolated Budgerigars. It would be doing myself less than justice if it were not mentioned here that I did not *expect* to see Budgerigars converging from near and far at every point of the compass, but I must admit to having been a little disappointed that the effect was not more marked than it actually was. All I can honestly report is that it certainly did operate to a relative degree. On three occasions, late in the day, when lost Budgerigars were seen or heard in willows or in apple trees I ran down the garden to switch on the recording, and on two of those occasions saw the birds almost immediately take notice and fly towards the sound, so finding their way in.

Taking stock, after this trial I had to conclude that the use of modern equipment had not been successful. I had lost another eight or ten birds, one or two nests of young ones had perished in consequence, and in general it had been an unhappy experience. Education through amplified Budgerigar talk was not a feasible proposition and it was

clear that I must think again. It even occurred to me that I might have made a fool of myself in front of the avian world ; perhaps the language that I had amplified so greatly was abusive ? If so, then what a story for Sparrows to laugh at !

1960

One hope still remained, and since the application of the method ought to have been so obvious to me I can only blame myself for not having used it and been successful in the first place. Pigeons are the best and most reliable of all liberty birds, yet even *Columba livia* needs a little education about the *appearance of home from the outside*. At one time I used to lose a number of young pigeons when first they were allowed out of the loft. They would take off from their well-known and well-loved home, never to return, and this simply because they had never been taught to recognize it from the outside; in fact they had never seen that view at all.

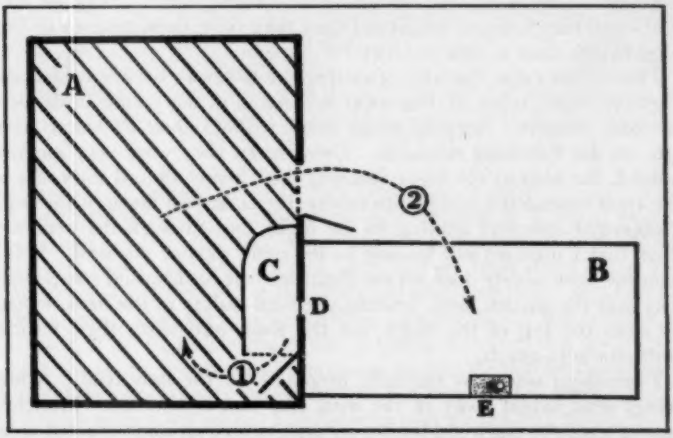

FIG. 4.—Plan, showing the direction taken by birds from their indoor shelter to the flight. A—shed, B—flight, C—shelter, D—Budgerigar doorway (closed), E—entrance to flight and food tray, 1—escape into shed, 2—escape through window.

The education of my pigeons has latterly been effected in three stages, (*a*) to get to know the inside of the home, where there is food and safety, (*b*) to learn the way into it from confinement in a wire-netting cage immediately outside the entrance door, and (*c*) to learn what home looks like from the outside. This last item of education is effected through placing the pigeon in a cage away from its home. The cage must be adequately large for its composure so that it may quietly exercise the mental process of perceiving the appearance of its home.

The young birds are confined in this way for a day at a time in each of three or four parts of the garden from where the loft may be seen. At the end of each day, when they are both hungry and thirsty, I place them in the wire-netting cage immediately outside the entrance door, from where they must make their own way in to find the food and water. This they are very anxious to do, and since following this procedure I have only lost one newly-acquired adult, and not any of the young ones.

But how could I apply this method to Budgerigars? That was a different question. To receive impressions of the outward appearance of their flight they must be in a sufficiently composed state; and that, I considered, could hardly be expected after the flurry of a catching do, or in the crowded conditions of a portable cage. I then wondered if I could employ a part, only, of the "training course for pigeons", and while thinking of this possibility it occurred to me that those Budgerigars which I had lost had been full-fed at the time of release, and so went off without a care to explore the wonders of a new world. Suppose they had been very hungry, might not they then have been anxious to find food rather than to take exercise?

Out of this came the idea of closing the doorway between shed and flight at night, when all the cocks and many of the young birds were roosting indoors; keeping them there without food or water until late on the following morning. Then, when they were very anxious indeed, the hens in the flight shouting their heads off and the cocks in the roost ravenously hungry, to release the cocks, *not* through the little Budgerigar doorway leading to the flight, but through the ordinary door that I used myself, leading to the main part of the shed. If the window were widely open on the flight side the birds would escape that way into the garden, and, hearing the loud calling of the hens, would fly onto the top of the flight, see the food, and exert their utmost endeavours to get in.

Everything was now carefully prepared for the new trial. A few things were tidied away in the shed and one or two stray branches lopped from the dogwood bushes outside, to give an unobstructed view of the flight from the shed window. In the end I was satisfied that every encouragement would be given for avian emotions and desires to operate towards the wished-for end. I decided on boldness. I would procrastinate no longer with timid trials, but would make all those who slept indoors that night find their way from the roost to the flight, where their breakfast was so obviously ready and the hens so anxiously waiting. I only waited now for the weekend when I should be at home and could endeavour to cope with unexpected eventualities.

On the evening of Friday, therefore, the outlet to the flight was closed, and on the Saturday morning the birds found themselves unable to make the usual exit into the flight. By 9 o'clock there was

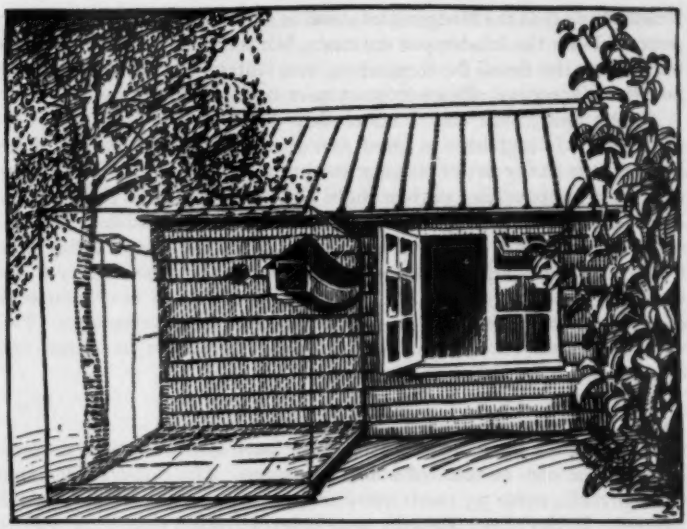

FIG. 5.—General view of the flight, showing the birch tree over the entrance hole, and the open window of the shed.

considerable hubbub ; by 10 o'clock there was shouting ; by 11 o'clock most of the hens were out of their nest-boxes, shouting as loudly as they could, and by 11.30 the whole place was in an uproar, at both sides of the Budgerigar doorway. They were indeed now thoroughly well attuned, and conditioned to make the required response ; so I opened the half-door that leads into the shed, opened widely the window at the back of the flight leading to the garden and retired to a distance to watch the result. Several minutes passed before the first birds began to make their appearance, flying straight out through the open window as though to fly right away. The isolation and the fasting had, however, sharpened their senses and, in consequence, they made a response to the calling of the hens by an immediate halt in their career and a descent onto the top of the flight. Once there nothing could have been more inviting than the food so obviously displayed ; their one aim was to get to it quickly ; they found the entrance hole immediately over the food tray and they entered.

I am sure the behaviourists would have some special term for the maximum effect that was achieved. " Magnetic " is a word that might apply. It was like opposite poles attracting ; there were empty crops and a tray full of food ; there was desperate loneliness and a wifely welcome, a sight for hungry eyes and a sound to calm distraction.

I cannot say that the Budgerigars stood in a queue, or that they actually poured down the lobster-pot entrance, but almost so. They only had to discover the detail for themselves, everything else had been laid on, and the percentage efficiency must have been very high indeed.

At the end of the day I concluded that the trial had been very successful. It had been a good first lesson for the education of my Budgerigars in the art of homing, so that they now knew something of the outside appearance of their flight and of how to make their way in. I thought it still unsafe, however, to release them, full-fed, into the open, and decided that they must have further lessons of a like kind before their education had been completed. The whole process was therefore repeated twice more, and I was pleased to notice on each occasion an increase in the purposeful nature of their responses. This was the process of " facilitation " already referred to, the final part of their educational course.

Present Position

The ultimate outcome is that we now have a scene from a tropical clime in the cool comfort of a Surrey garden. The house stands on a sloping bank, some 35 yards away from a stream that is lined by tall willows. Under these pleasant trees is level ground that is too wet to cultivate and is allowed to pass through its own succession of the floral year : marigolds are followed by foxtail, which introduces the buttercups, then comes ragged robin with pink-tipped Yorkshire fog, and latterly, meadow-sweet, loosestrife and the great hairy willow herb. All are under partial control so that no one kind is allowed to take complete possession for itself—nor nettles to invade.

In June and July it has a brilliance of green that is unsurpassed and as the evening breeze turns up the silver side of the willow leaves and the low sun lights the blue-grey of their trunks and boughs it is a cool and colourful haven of succulent growth, a place for sun-scorched Bedouins to dream of. Three strange birds appear as we look down from the bank above. They fly swiftly across the level bottom and up into the willows. One of them is blue, bluer than the Kingfishers that frequent the stream, a second is greener than the grass below, and the third is white. Soon afterwards another blue one appears from nowhere, flying steeply down, in a power dive that brings him to within a yard of the ground ; he then makes a miraculous turn and shoots like a rocket over the top of the tallest willow tree, to appear again almost immediately, at the side of the tree. He must have made two turns with extraordinary dexterity to have reappeared so quickly, flying towards the birch tree that is over the inlet to the flight, where he joins the chattering group already there. It is clear that he is a young bird, enjoying the power of wings and the skill with which he can make use of them.

Later on a group of five fly through the garden and two others, a dark green and a light green are seen in a rapid chase round a small hazel tree. They dive over the ridge of the shed clearing it by two or three inches only, then make an impossibly quick change of direction and again finish in the birch tree over the entrance hole. Presumably these also are young birds, to find it worth while expending effort so unnecessarily. The tree over the entrance hole is the favourite where I have counted up to eighteen birds at one time. Some seem to spend most of their day there, and others find a particular pleasure in climbing up the ladder to go out and then, soon afterwards, climbing in again. This is repeated at intervals throughout the day, with only short flights and brief visits to other trees.

There are, of course, other ways of keeping Budgerigars at liberty. To place nesting-boxes in the garden is one that has the advantage of cock birds that may continually be seen trafficking with food from hopper to nest box ; the disadvantage is that of losing most of the fledglings. One of my acquaintances merely throws the Budgerigar house open in the spring of the year, come what may. Sparrows welcome this as a sign of weakness in their enemy man ; so they make free, usurping the homes of their betters, grabbing the best of the food and desecrating the nest boxes with abominations of straw in order that their own misbegotten and impudent brats may be reared in luxury.

My short experience has convinced me that the Duke of Bedford's advice is sound ; Budgerigars need a certain amount of discipline. If too much freedom is allowed, so that they come out full-fed late in the evening, they are apt to spend the night out ; at first they only do this occasionally, but later it becomes a bad habit. As they become increasingly familiar with more distant trees they get ideas of still wider exploration, losing all sense of the security of a particular home, and forgetting their reponsibility to the community to which they belong. This is a process of demoralization of liberty Budgerigars such as, in my opinion should not be tolerated.

On this account I have designed a clockwork apparatus whereby weights fall and levers move to bring about a morning release at 10.30 and a closing of the door again at 5.00 in the evening, after which all late-comers must use the lobster-pot opening and stay indoors when once they have re-entered. I also plan separate winter accommodation for cocks and hens, and a trap for catching them whenever they must be handled for any purpose—There is no end to these affairs !

* * *

NOTES ON KEEPING THE WHITE-HEADED DUCK (*Oxyura leucocephala*) IN CAPTIVITY

By DON ALBERTO DURÁN, Director Parque Zoológico,
Jerez de la Frontera, Spain

Two ducklings were received from Las Nuevas, in the marismas of the Guadalquivir, one on 30th July and the second on 7th August, 1960. The sex was not known. We fed them on minced spinach, beet or lettuce, wheat, rice, minced liver or meat, and shrimps or minced fish. The food was thrown into the pool because they would not take food that was not right in the water. We tried placing the pen below the edge of the pool with water and food in it but they would not take it.

From 30th July to 5th August the water was changed every day without cleaning the bottom of the pool but from then on the pool was cleaned every week and the water changed daily. The food was taken from the bottom and sides of the pool but always under the water. The green vegetables which remained on the surface were also taken. The birds were very fond of liver.

From 21st August soluble blue Cobial, a vitamin compound of vitamin A + B_2 + pantothenic acid + Colina was put in the water. At the same time we began to give them aureomycin (Chlorotetracycline unrefined, soluble), dissolved in water, once a week.

On 28th August they appeared to become " draggled " by being in the water. A few days after starting to give them the vitamins and aureomycin and cleaning the bottom of the pool this condition cleared up and from then on they were in completely normal plumage, that is to say the appearance of being " draggled " disappeared.

During the day they spent very little time in the water. They preferred to feed during the night, from midnight to four in the morning.

On the 18th October the bird which was received last showed lameness which prevented it from putting the right foot to the ground. On examination of both birds it was found that they had some abscesses in the joints of the feet, some already formed and others in course of development. On 21st October treatment was begun with injections of avian " Covapen E " based on streptomycin ; 0·40 cc. of this product was given to each bird for three days, and repeated after an interval of four days. This treatment was continued until 4th November when they had their last injection. The abscesses had completely disappeared and since then have not recurred.

The birds are rather quarrelsome, the second, received on 7th August, dominating the other.

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[Alberto Durán

WHITE-HEADED DUCK (*Oxyura leucocephala*)
Two ducklings in the Zoological Park, Jerez de la Frontera, Spain

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They were first weighed on 18th August and every week since then; the following is the record of their weights :—

	The first bird (received on 30th July) Grammes	*The second bird (received on 7th August)* Grammes
Aug. 18–	380	380
25–	380	370
Sept. 1–	380	380
8–	420	380
15–	460	380
22–	460	380
30–	460	380
Oct. 6–	480	400
13–	480	420
19–	500	410
27–	520	460
Nov. 10–	480	430
17–	500	440
24–	540	500
Dec. 15–	620	540

Special mention must be made of the interest and competence of our technical staff—the curator Senor Lassaletta and the veterinarian Senor Valverde, thanks to whom we have been able to keep these specimens alive in captivity, whereas previously they have died within two or three days of being captured.

* * *

The following note has been received from J. J. Yealland :—

The White-headed Duck ranges from southern Europe to north Africa and eastward to parts of central Asia, some populations being sedentary and others moving southward for the winter to Egypt, south-eastern Caspian Sea, Iraq and northern parts of India. It is a bird that appears to prefer brackish or even salt water to fresh. According to "The Birds of the U.S.S.R." the Savkah, as it is known in Russia, nests among reeds and rushes, sometimes making use of old nests of Grebes, Coots and Pochards. Six eggs are said to be the normal clutch, though as many as thirteen (possibly laid by more than one bird) have been recorded. There is a record of an incubated egg being taken from a nest near Astrakhan and left in an unheated room for a week whereupon it hatched. The food is said to consist largely of plant matter (seeds and foliage); larvae of flies and other insect life, molluscs and crustaceans also being eaten.

* * *

THE BREEDING OF THE SOUTH AFRICAN STONE-CURLEW

By J. W. W. LOUWMAN (Wassenaar, Holland)

In June, 1958, Wassenaar Zoo received two South African Stone-Curlews. The birds were placed in one of the large central aviaries of the Louise Hall, the bird-hall of Wassenaar Zoo, where they lived together with several species of exotic pigeons, such as Australian Crested Pigeons, Bleeding-heart Pigeons, Barbary Doves, and others. The aviary is planted with oaks, beeches, several coniferous trees, and some shrubs. It is about 17 feet high and has an area of approximately 25 by 30 feet. The climate of the Louise Hall is to some extent sub-tropical; the whole building being chiefly a glass construction, temperature at day-time rises quickly, but drops equally quickly at night. In winter, in spite of the fact that only the side aviaries are slightly heated, it is very rarely that the temperature drops below zero C. The soil of the aviary is mainly sandy and the Stone-Curlews did very well there, but we were not quite sure whether they would turn out to be a true pair or not.

At the end of March, 1960, however, they started making a nesting mound on the ground, which they placed with one side against a small shrub (*Ligustrum ovalifolium*). Saying they built a nest is giving them rather too much credit, because what they actually did was to make a small hollow and bring there some pieces of shell and an occasional twig. On a later occasion, when they built a nest in September, they used the leaves of a beech tree as nesting material. The first eggs were laid on 2nd and 4th April, but no more followed. The eggs had the characteristic colouring, i.e. dark-brown spots and patches on a light-brown general colour, but there was a decided difference between the two, the second egg being lighter in colour than the first one. As we did not want to disturb the birds, we did not measure the eggs (photograph 1). After two weeks of brooding, one egg was miraculously gone one morning and no remains were found. Of course we had to enter the aviary every day and it was remarkable to see the attitude of the two birds. Whichever bird was sitting on the nest remained there as long as it possibly dared, but the other bird immediately attacked, or at least put on a threatening attitude. When staging these vague attacks the bird muttered excitedly in a low voice. It is not easy to describe the sound they made, but it was easily understood that it was meant to frighten us away from the nest.

On 26th April one young one was born (photograph 2). It was almost invisible on the soil, being mainly sand-coloured with a few dark patches on its back and head.

1. The first two eggs were laid with an interval of two days, the last one of which disappeared without a trace after two weeks.

2. The young bird was born on 26th April and showed a sandy colour with dark patches on head and back.

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3. It was taken out for a walk after three weeks and came running to me whenever I whistled an imitation of its own call.

4. Past the stage of being hand-fed it could soon defend itself against other birds such as the European Roller as seen in this photograph.

How very effectively this protective colour is used was best demonstrated when the bird reacted to a warning call or another noise that made it afraid. In that case the little bird made itself very flat, putting its head and neck on the ground and lying quite still.

The breeding of birds and especially of those which do not have the protection of a solid nest, is always a hazardous affair. Dangerous enemies are to be found practically everywhere. The birds at the Zoo are, of course, better off, but breeding in an aviary with a mixed population still requires some precautions. The birds need not fear an attack from the pigeons and doves in the same aviary. They were as a matter of fact far too aggressive to allow any of these inhabitants to come near the nest of the young bird, but in the neighbouring aviaries there were already some interested spectators: African Red-billed Hornbills (*Lophocerus erythrorhynchus*) on one side and Kookaburras (*Dacelo gigas*) and several Jays on the other side. The wire netting was perfectly all right for the adult birds, but for so small a youngster there was definitely danger ahead. Something had to be done, but putting in narrow wire meshing disturbed the adult birds so much that they started to trample on the youngster and even began to snap at it. When we came to the rescue our first impression was that we were too late. When I took the bird it was quite limp and only after I tried to take a photograph in its natural hiding posture, I noticed that it was still alive, though probably unconscious. Immediately I took it home with me and put it under a thermal lamp in one of my terrariums. At that time I did not expect it to recover, but soon after it was on its feet again and quite happy. So far so good, but how to feed a young Stone-Curlew. The next day it refused all food except for a few mealworms, but soon thereafter it took earthworms, flies, balls of minced meat, etc. Additional ingredients were hard-boiled eggs, ground dried shrimps (after softening), but except for live insects, worms, etc., it did not take one bit of food unless I put it on a saucer right in front of it piece by piece. I had to put every bit of meat and shrimp and every half-dead fly before it to make it eat. In this manner it was fed all the day through from morning till late at night.

Except for the muttering scolding voice of attack, we never heard a sound from the adult birds, but the young one often uttered a squeaking tone, rather high and resembling the noise a badly greased barrow-wheel makes. I heard this noise all day through whether I was in the room or not and also often in the late evening hours.

A terrarium is not exactly the place where one generally puts birds and this one, only measuring about 2 feet long and 1½ feet wide, was certainly not a proper place to keep a Stone-Curlew.

This is why, when I was in the room, I took it out and allowed it to walk through the room at liberty. When a week or two old I also took it outside with me and as soon as I made the squeaking noise I was used

to making as an imitation of its own call it always started to run quickly towards me (photograph 3).

If, however, I clapped my hands it went down to the ground in its hiding posture with its head, neck, and belly flat to the ground. After six weeks it started to fly a bit once in a while and within a week or ten days I felt that it was about time for it to become self-supporting. It was brought back to the Louise Hall in a central aviary, but of course not the same where the old pair was still residing. It is now sharing its place with a pair of Crested Wood Partridges and a European Roller. It was only here that it had to learn to find its food itself and not to be hand-fed, but this it learned pretty quickly and fiercely counter-attacked the Roller if it dared come near any piece of food which the Stone-Curlew regarded as its rightful own (photograph 4). When attacking it spreads its wings and mutters the low sound its parents did when they were nesting. However, if I enter the Hall and utter the imitation squeaking sound of the young bird it still answers and starts to run towards me as quickly as it can.

This same year we had three other nesting attempts. On 11th May and 27th June, one egg was laid but the birds did not brood.

On 28th September, out of the second real nest which was constantly brooded, two young were born, but they died shortly after birth without ever having been on their legs at all.

* * *

FURTHER DATA RELATING TO THE BREEDING BEHAVIOR OF THE SPLENDID PIGEON

(Columba speciosa)

By Professor CARL NAETHER (Encino, California, U.S.A.)

Supplementing my brief report (in the last number of the MAGAZINE) on the behavior of the three Splendid Pigeons which have been in my aviaries for three years, I am pleased to state that yesterday, 28th June, their first youngster flew off the nest. The young pigeon is in vigorous health, and, like its parents, arboreal in habit. While the young of many other species of foreign doves and pigeons when leaving the nest for the first time are prone to drop to the floor of the pen and to remain there until they have achieved some dexterity in flying, the young Splendid Pigeon flew directly to a high branch in the aviary and has to this writing not dropped to the ground.

Whereas the mature pigeons have a rather bright red beak, one of the attractive features of this species, the youngster's beak is black, as are its feet. The overall coloration of this young pigeon is a non-glossy, rather drab rust-red. The white spots, so conspicuous on mature specimens, are entirely absent from the plumage of the young pigeon. However, the lower abdomen shows a whitish-grey color.

Most unusual and " unpigeonlike " has been the behavior of the three old birds in that there has not been the slightest tendency to fight the third bird, which I believe is a hen. Moreover, while pigeons usually become quite jealous of their nesting territory during breeding seasons, defending it vigorously, the Splendid Pigeons have never in any way exhibited aggressive behavior toward a male Bartlett's Bleeding-heart Pigeon which shares their aviary. In these respects the behavior of the Splendid Pigeons has, at least in my forty years' experience with both domestic and wild species, been *unique*. Incidentally, one of the parent birds remained on the nest with the youngster day and night until the latter flew off the nest, having been in it for well over three weeks.

I now believe that the reason why these pigeons did not raise their first squab, which I found dead in the nest when it was about ten days old, to maturity is that undoubtedly they were frightened off the nest during the night. When they failed to return to it promptly, the young squab, still very much in need of warmth, died of exposure, even though its crop was well filled.

Since this is the first time in many, many years that Splendid Pigeons have bred successfully in any American aviaries, I should appreciate learning if and when this species was first raised in the United States

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HATCHING AND REARING OF KOOKABURRAS IN THE NATIONAL ZOOLOGICAL PARK, SMITHSONIAN INSTITUTION, WASHINGTON, D.C.

By Senior Keeper W. F. WIDMAN and Supervisory Keeper H. M. VOROUS

Kookaburras (*Dacelo gigas*), also known as Giant Kingfishers and Laughing Jackasses, have been exhibited in the National Zoological Park almost continuously over the years. The first ones were sent by Dr. F. W. Goding, United States Consul at Newcastle, New South Wales, in 1903. With their handsome appearance and raucous laughter, they are always favorites with their keepers and with the public.

Kookaburras in this Zoo had been shown in rather bare cages, furnished with perches, and had never shown any signs of nesting until a special cage was arranged for them last year. This was prepared by the keepers of the bird division as an exhibit of tree-nesting birds. Into it were put a pair of Kookaburras obtained from Sir Edward Hallstrom, President of the Taronga Zoological Park Trust, Sydney, Australia, in 1954. Sharing the cage were a pair of Grey Hornbills (*Tockus birostris*), two Golden-backed Woodpeckers (*Brachypternus benghalensis*), one Scaly-bellied Woodpecker (*Picus squamatus*), and ten Bobwhite Quail (*Colinus virginianus*). The quail were removed when nesting activities by the Kookaburras were first detected. The hornbills were removed when the young were ready to leave the nest.

The cage, with a glass front, is 15 feet wide, 9 feet deep, and 10 feet high, and contains several tree trunks of various sizes. A large hollowed birch, 4 feet in circumference, was selected by the Kookaburras for nesting. We filled the tree with cane litter up to about 5 inches below a hole in one side. This opening in the tree was ignored, however, the birds tunnelling out dirt from an opening mostly underground at its base, and entering from that point, removing the cane litter from the lower part of the tree. We then had to put screening inside the tree to keep the remaining cane litter from falling down on the nest. When the excavating was complete, performed by both birds, the nest was 2 to 3 inches below ground level.

The first egg, an unblemished white, was laid 22nd February, 1961, with a second egg laid the following day. The female started incubating. A third egg was seen in the nest three days later.

The male started sharing the incubation duties four days after the first egg was laid. Neither bird would leave the nest until the other had entered. At no time during the twenty-five days of incubation was the nest seen unattended. On four different occasions the female was

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View of the Cage, showing the Kookaburra's Nest at the Base of the Third Stump from the Left. The cage was not thoroughly cleaned during the incubation for fear of disturbing the birds.

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KOOKABURRAS AND YOUNG

Upper left and right are young males. Centre left—young female. Lower left—adult male.

observed calling the male by rapping on the tree with her bill, and the male responded immediately and entered the nest.

Kookaburras at the National Zoological Park are fed exclusively on mice—an average of three a day—altered in no way other than cutting off the tails. It was decided prior to hatching to start the adult birds on mice that had been frozen, then cut in small sections, and thawed before feeding. This proved a wise decision as both birds were hesitant at first in accepting the cut-up mice, but the possibility of their attempting to feed whole mice to newly hatched young would have certainly proven disastrous.

On Sunday, 19th March, between 10 a.m. and 1.30 p.m., two-thirds of the blessed event occurred, the other third some time during that night or early the next morning. The young, bare of feathers and helpless, appeared to be all stomach and bulging eyes, even though the eyes were closed. The first day there was little feeding, six small pieces of mice.

The second day the unusual actions of the male, turning over leaves and rooting in the ground as if in search of insects, resulted in our offering roaches (*Periplaneta americana*) that were readily accepted. The second day the female left the nest three times, to eat, bathe, and once for no apparent reason at all. The male on all occasions immediately took to the nest. The light over the cage was left on until 10 p.m., allowing 15 light hours for feeding.

The food the first few days consisted of large roaches, twenty a day, trapped and freshly killed, and injected with multivitamins, and mice cut in quarter-inch lengths. Twelve chopped mice were offered and approximately four were eaten the second day. By the time the nestlings were seven days old, twelve mice a day were being fed. These figures apply to the whole family ; it was, of course, impossible to determine how much was eaten by the parents and how much fed to the babies.

The adults fed the roaches and mice directly, after having crushed the roaches with their bills. Even though the mice had been cut in small sections, the parents held them in their bills and rapped them against a tree limb until they were thoroughly crushed and pliable before feeding. The young birds grew rapidly ; at eleven days old they were three times their size at birth. Their eyes were still closed. They were eating sixty roaches a day, all injected with multivitamins—twenty at three different feedings—and twenty-one mice now being cut in thirds.

The young birds' eyes opened twenty-one days after hatching. They were then eating twenty-seven mice with twenty roaches a day. When about four weeks old, the more advanced of the three was seen at the entrance of the nest on several occasions, but was immediately forced back by the parents. Thirty days after hatching, the first bird was allowed to leave the nest. The other two were actually drawn out by

the female standing in front of the entrance offering the food, then backing out when the young attempted to feed with the offering still in her bill. This was repeated until she succeeded in her efforts to draw them out of the nest.

All three birds on leaving the nest were able to fly, only their bills and tail feathers were not fully developed. They had an overall darker plumage than the adult birds.

On 9th May, while the young birds were still being fed by the parents, the female again started nesting. She laid an egg on 10th May, another on 12th May, and a third on 13th May. The first brood were observed feeding themselves for the first time on 21st May.

Incubation began on 19th May and two of the eggs hatched on 6th June. On 7th June the female threw the remaining egg, which was rotten, out of the nest and broke it. The first hatching having been so successful, the same procedure was followed for the second. The two new babies are doing well.

* * *

LONDON ZOO NOTES

By J. J. YEALLAND

The Sarus Cranes which bred last year showed no sign of nesting at the same time this summer, but did so some four weeks later in mid-July. A possible reason for this was that the survivor of last year's brood lived next door and was on occasion offered food by the parents through the dividing wire-netting, but soon after this young one was moved out of sight of the adults, they turned their attention to nesting once more. If in the wild state the young survive, does this crane not breed each year but remain as a family party for two years, I wonder!

The second of last year's young, when almost fully grown, died as a result of being caught and held in order to have treatment for a slight injury to its beak, a death that might perhaps have been prevented by the administration of a tranquillizing drug. This year's chicks hatched between the 8th and 10th of August.

An arrival of especial interest is a Flame-crowned or Pucheran's Woodpecker (*Melanerpes pucherani pucherani*), new to the collection and presented, together with a Blue-rumped Tanager (*Calospiza cyanicollis cyanopygia*), a Black-eared Tanager (*Calospiza parzudakii lunigera*) and a Yellow-rumped Tanager (*Ramphocelus icteronotus*), by Messrs. G. H. and J. R. Newmark. The Woodpecker inhabits the area from southern Honduras to western and central Ecuador and a second race (*M. p. perileucus*) ranges from southern Mexico to northern Honduras.

Four immature Rollers collected in Spain by Mr. M. D. England have been deposited and two Squacco Herons received in exchange.

NEWS AND VIEWS

L. G. Middleton now has a flock of some thirty Masked and Fischer's Lovebirds flying at liberty—this must surely be unique.

* * *

John J. Yealland has been elected Editor of the *Bulletin* of the British Ornithologists' Club, in succession to Dr. J. G. Harrison, whose period of office expires at the end of the present year.

* * *

As described in an article in this number of the MAGAZINE, the Rev. J. R. Lowe has successfully bred the Stonechat (*Saxicola torquata*). This is a rare event, in fact I have only one previous record—W. E. Teschemaker, Devon, 1910, three hatched, two fully reared.

* * *

Frank Meaden has three pairs of Waxwings (*Bombycilla garrulus*) together in an aviary. One pair hatched their three eggs after sixteen days' incubation, but unhappily none of the young ones lived longer than four days. A second pair also had three eggs which, however, failed to hatch.

* * *

A. W. E. Fletcher has bred the Sulphury Seed-eater (*Serinus sulphuratus*). The first nest was in the shelter of a large mixed aviary. One fully-fledged young one was found dead on the floor. A second nest was built in the flight ; a single egg was laid and the resulting young one was successfully reared. The hen is now sitting for the third time in the same nest on four eggs. This, too, is an uncommon event, possibly the first since W. Shore Baily's " first " in 1914.

* * *

Lloyd B. Thompson, British Columbia, writes : " The birds are doing quite well so far. At present we have two baby Ringnecks, three split-blue eggs hatching, and two lutino hens just laying. Plumheads have four young feathering. Prince Lucien's Conures have ten young. One pair of Lineolated Parrakeets have five young and the other pair have five eggs. Some Lineolated are as easy, or easier, to breed with than lovebirds : they are much hardier and can stand considerably more cold. Three young Bourke's are just leaving the nest. Redrumps have six fertile eggs."

* * *

Progress report from Major V. Dilwyn Jones concerning his Salmon-crested Cockatoos. He writes : " Just before I went on holiday in June I was fairly confident that they had laid again and on my return early this month I managed a peep one evening and found the cock

bird sitting on two eggs which looked 'good'. On Tuesday of last week [11th July] we heard squeaking in the log and it sounded like two chicks. This evening I caught both birds off and found one live chick and one dead one. The live youngster looks about a week or so old, but does not appear to be very healthy—it seems a bit bloated looking.

"The young Citron-crested is fine and I think should be out next week."

* * *

News from New Guinea. F. W. Shaw Mayer writes: "Sir Edward Hallstrom was up here for three days in the middle of June—his visits are always memorable. A bird British aviculturists would like to have is our Fig Parrot 'Double-eye' (*Opopsitta diophthalma festetichi*). It is very similar to *O. d. diophthalma*, which I believe dear old Frost once brought to England. They are plentiful at 4,000 feet (1,500 feet lower than we are here at Nondugl). They are easy to cater for—sunflower seed and fruit—and easy to breed. We have a number. Early this year we bred one Lesser Bird of Paradise (*Paradisea minor finschi*) and a Ribbon-tailed (*Tæniaparadisea mayeri*)—both young birds have now grown up. At the moment a pair of Blue Birds of Paradise (*Paradisornis rudolphi margaritæ*) have a young one in the nest eleven days old. This pair successfully bred last year." If only Sir Edward would send us regular notes from his Fauna Station!

A. A. P.

* * *

REVIEWS

GENETICS FOR BUDGERIGAR BREEDERS. By T. G. Taylor, M.A., Ph.D., and C. Warner. Published for "Cage Birds" by Iliffe Books Ltd., London, 1961. Price 17*s*. 6*d*. net.

The Budgerigar has been a favourite object for the study of genetics in birds for many years, since under domestication it has developed a very wide range of colour variations and other mutations. Moreover it is of especial interest as one of the few domesticated species that has never been crossed with any other species. Dr. Dunker was a pioneer in this subject and together with Cremer produced tables of expectation which were given to the Budgerigar Society. These authorities and also Steiner in Switzerland, showed that the inheritance of colour in these birds followed the classical Mendelian principles. The best known work in this country, however, is *The Genetics of the Budgerigar* by Professor F. A. E. Crew and Miss Rowena Lamy of the Institute of Animal Genetics, University of Edinburgh, published in 1935, but this work has long been out of print, and there was a clear need for a book to assess the present position of the subject, and to indicate lines of advance.

The various general books on the breeding of Budgerigars, including such works as *Budgerigar Matings and Colour Expectations* by F. S. Elliot and E. W. Brooks, do not attempt to give full genetical details.

The present work will be of great value to the many breeders who find it difficult to understand the genetical side of Budgerigar breeding. Dr. Taylor, who studied genetics at Cambridge, has kept Budgerigars for almost thirty years and regards himself primarily as a fancier, and during the past four years, in collaboration with Mr. Warner, also a geneticist, has been engaged in a programme of research on the mapping of the sex-linked series. The book covers the whole field of Budgerigar genetics in a simple and direct manner and should be intelligible to any one prepared to make a serious study of the subject. The first chapter, based largely on the work of Dr. Auber, deals with feather structure and colour, and whilst not essential for an understanding of the genetics of colour, it certainly adds to the interest of breeding these birds, and enables predictions to be made of colour expectation when new combinations of varieties are made by cross breeding. Then follow chapters on genes and expectations, the chromosome theory, leading on to linkage and sex-linkage which then become understandable. Practical breeders will find the chapters dealing with mutations and what to do with a new mutation of especial interest ; also the summaries of the composition of the various colour varieties and how they are produced. The final chapter deals with genetics for the breeder of exhibition Budgerigars, with a table showing the proposed names and symbols of mutant genes in the Budgerigar.

This work can be thoroughly recommended to both amateur and professional breeders who wish to have a better understanding of the scientific basis of the subject.

E. H.

* * *

BIRD DOCTOR By KATHERINE TOTTENHAM. Thomas Nelson and Sons, Ltd. Edinburgh, 1961. Price 15*s*.

This is an interesting collection of anecdotes of the author's experiences with many kinds of sick and damaged birds, and the way in which by trial and error she has learnt how to treat the different cases. The patients usually became quite tame during the treatment and the behaviour of such diverse pets as a Razorbill and other seabirds, various corvids, Blackbirds and even a Mute Swan, to name only a few of the birds kept for varying periods after their recovery, is graphically described. It is noted that once tamed and provided with the best possible conditions, most pet birds are more than content with their lot.

E. H.

CORRESPONDENCE

PACKING BIRDS FOR AIR SHIPMENT

I have read with interest the article " Packing Game Birds for Air Shipment " by K. C. Searle in the January–February issue of the AVICULTURAL MAGAZINE. I agree with Dr. Searle that the padding for the top of the crate is of paramount importance. With adequate protection against head damage and a satisfactory water supply, the wildest birds can be safely handled by air freight.

I have a suggestion for padding the top of the crate which may be of interest. In shipments of birds to Ceylon and to Indonesia, I have found that sheets of foam rubber make excellent padding for the shipping crates. My crates are constructed of 1 by 1 inch pine frames covered with $\frac{1}{4}$ inch plywood. The front is covered with $\frac{1}{10}$ inch mesh hardware cloth with the feed and water troughs set under the edge of the screen. The top and sides of the crate are padded with foam rubber sheet. For small birds I use $\frac{1}{2}$ inch thick foam rubber and for the largest and wildest, $1\frac{1}{2}$ inch foam rubber sheet.

The sheets of foam rubber are available here from upholsterer shops as scrap pieces at a reasonable price. The sheets of foam rubber may be glued in place or stapled to the roof and sides from the rubber side. The staple will be completely imbedded in the rubber. If the ends of the staples extend through the plywood, they should be bent over to avoid injury in handling. I have found that some air-lines staple their labels on the crates and the ends of the staples protrude inside. These sharp points may cause serious damage to the birds. As these labels are most often stapled on the sides, the padding of foam rubber covers them so no damage to the birds occurs.

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J. G. SUTHARD.

RAIN BATHING

In his recent article on " Rain Bathing " (*antea* 67 : 90), C. J. O. Harrison described the behaviour of Budgerigars (*Melopsittacus undulatus*) " bathing " in green salad, and concluded that " the recognition of wet vegetation as a bathing medium appears to be innate ".

My own observations agree with those published by Harrison, but I have also noted " bathing " behaviour under the following conditions : (i) in a glass bowl, filled with water to a depth of 3 or 4 inches, with green leaves floating on the surface of the water (ii) in a green plastic bowl, filled with water as before, but without any floating vegetation. Behaviour was equally intense under either condition, but no bathing occurred in a glass bowl in the absence of vegetation.

It would thus appear that the colour green, in association with water, is sufficient to release this behaviour, and that the form in which this colour is present is not important.

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THOMAS L. S. DOOLY, to Bryn Afon, Llandegfan, Anglesey.

DR. HOWARD GUREVITZ, to 3700 Edison Street, San Mateo, California, U.S.A.

C. J. O. HARRISON, to 14 Dawlish Avenue, Perivale, Middlesex.

F. E. B. JOHNSON, to The Grove, Stagsden, Bedford.

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RALF H. MASURE, to c/o B. Rucker, 1665 Vyse Avenue, Bronx 60, N.Y., U.S.A.

F. W. SHAW MAYER, to Hallstrom Fauna Station, Nondugl, via Goroka, New Guinea, via Australia.

P. ORSATTI, to 97 Beaver Avenue, Toronto, Ontario, Canada.

K. L. PENWARDEN, to Alken Lodge, Orange Road, Newlands, Cape Town, South Africa.

C. T. RIDLEY, to Group 7, Box 6, RR. 1, Headingley, Manitoba, Canada.

D. H. S. RHODS, to Rode Manor Gardens, Rode, Nr. Bath, Somerset.

R. H. SMEATON, to P.O. Box 50, Mazabuka, Northern Rhodesia.

R. G. L. TILLEY, to "Niltava", 243 Avenue du Chêne, Heusy, Verviers, Belgium.

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